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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/037,870	10/22/2001	Richard W. D. Booth	034942-258	4801

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EXAMINER

WARE, CICELY Q

ART UNIT PAPER NUMBER

2634

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/037,870

Applicant(s)

BOOTH ET AL.

Examiner

Cicely Ware

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 15 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 13, 14, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1</u> . | 6) <input type="checkbox"/> Other: _____ |

Drawings

1. This application has been filed with informal drawings, which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

a. Fig. 9a, 9b, 9c, 15b, 15c, 16a, 28b, examiner suggests bolding the figure labels, for uniformity purposes.

b. Fig. 16a, examiner suggests un-bolding the figure description for uniformity purposes.

c. Fig. 28b, examiner suggests inserting a figure description for uniformity purposes.

d. Fig. 2b, 16b, 17b, examiner suggests applicant insert these figures in correct number order with the other preceding figures.

Specification

2. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

3. The disclosure is objected to because of the following informalities:

a. Pg. 3, line 4, applicant uses the phrase "another that deal specifically". Examiner suggests using "another that deals specifically" for clarification purposes.

b. Pg. 5, line 6, applicant makes reference to a "DPDCH" acronym.

Examiner suggests spelling out the acronym at this first reference for clarification purposes.

c. Pg. 6, line 20, applicant makes reference to "ACPR and EVM" acronyms. Examiner suggests spelling out the acronyms at this first reference for clarification purposes.

d. Pg. 8, line 10, applicant uses the phrase "with the appended drawing. In the drawing". Examiner suggests using "with the appended drawings. In the drawings" for clarification purposes.

e. Pg. 10, line 12, applicant makes reference to a Fig. 17. Examiner assumes applicant means Fig. 17a. Examiner suggests applicant change Fig. 17 to correct figure number.

f. Pg. 11, line 5, examiner suggest applicant delete second "a".

g. Pg. 11, line 7, applicant makes reference to a "PSD" acronym. Examiner suggests spelling out the acronym at this first reference for clarification purposes.

h. Pg. 11, line 7, applicant makes reference to a Fig. 34. Examiner assumes applicant means Fig. 24. Examiner suggests applicant change Fig. 34 to correct figure number.

i. Pg. 11, line 16, applicant makes reference to a "CORDIC" acronym. Examiner suggests spelling out the acronym at this first reference for clarification purposes.

j. Pg. 12, line 19, applicant uses the phrase "signal phase component".

Examiner suggests applicant use "signal phase component" for clarification purposes.

k. Pg. 13, line 2, examiner suggests applicant insert the correct application and docket number for the referenced patent application.

l. Pg. 36, line 3, applicant uses the phrase "possible is order to". Examiner suggests using "possible in order to" for clarification purposes.

m. Pg. 36, line 24, applicant uses the phrase "but will small". Examiner suggests using "but will be small" for clarification purposes.

n. Pg. 38, line 5, examiner suggests re-writing this line for clarification purposes.

o. Pg. 42, line 19, examiner suggests moving the heading to the next page.

Appropriate correction is required.

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

5. Claims 6 and 15 are objected to because of the following informalities:
- a. Claim 6, examiner suggests deleting the second period.
 - b. Claim 15, applicant uses the phrase "to formed a modified". Examiner suggests using "to form a modified" for clarification purposes.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. Claim 3 recites the limitation "approximate time instant" in line 2.
- a. approximate time instant. The use of "approximate" is vague and indefinite limitation, this does not give a limitation for the time instant. There is insufficient antecedent basis for this limitation in the claim
7. Claims 3, 5, 6 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
- a. said approximate time instant, in claim 3
 - b. said function, in claim 5
 - c. the small number of points, in claim 6
 - d. the intersecting line, in claim 19

There is insufficient antecedent basis for these limitations in the claims.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-12, 16, 17, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by O'Dea et al. (US Patent 5,805,640).

(1) With regard to claim 1, O'Dea et al. discloses a method of altering a communications signal to reduce an average-to-minimum power ratio thereof, the communications signal being formed using pulse-shaping techniques applied to instances of a pulse of a given form, the method comprising, for at least one signal component (col. 1, lines 61-65, col. 2, lines 55-58, 60-62): setting a desired signal minimum (col. 2, lines 38-40, col. 3, lines 25-26); identifying a time instant in the vicinity of which the signal is likely to fall below the desired signal minimum (col. 2, lines 33-35, col. 3, lines 18-26); using a mathematical model of the communications signal in a time interval said time instant, determining a minimum of the communications signal during said time interval (col. 4, lines 40-67, col. 5, lines 1-10); determining a measure of at least one of magnitude and phase of the communications signal corresponding to the minimum of the communications signal during said time interval (col. 5, lines 6-10); and if said minimum of the communications signal is less than a desired signal minimum: in accordance with said one of magnitude and phase, forming a scaled corrective pulse (col. 4, lines 34-36); and adding to the signal component the scaled corrective pulse, in timed relation to the signal,

to form a modified communications signal having reduced average-to-minimum power ratio (col. 5, lines 39-49).

(2) With regard to claim 2, claim 2 inherits all the limitations of claim 1. O'Dea et al. further discloses repeating said identifying, determining, forming, and adding steps to form from the modified communications signal a further modified communications signal (col. 5, lines 57-59, 63-67, col. 6, lines 1-8).

(3) With regard to claim 3, claim 3 inherits all the limitations of claim 1. O'Dea et al. further discloses determining a measure of both magnitude and phase of the communications signal at said approximate time instant (col. 4, lines 56-67, col. 5, lines 1-5).

(4) With regard to claim 4, claim 4 inherits all the limitations of claim 3. Furthermore, O'Dea et al. discloses calculating values of the communication signal at a small number of points near said approximate time instant; and fitting a mathematical function to the values (col. 4, lines 40-67).

(5) With regard to claim 5, claim 5 inherits all the limitations of claim 4. Furthermore, O'Dea et al. discloses in (Fig. 6) wherein the communications signal is represented with a signal plane having an origin denoting a signal of zero magnitude and determining a measure of magnitude comprises determining within the signal plane a point of intersection between said function and an intersecting line that bears a predetermined relationship to the function and that includes the origin.

(6) With regard to claim 6, claim 6 inherits all the limitations of claim 5. O'Dea et al. further discloses in (Fig. 2 (210)) wherein the small number of points is two, and the

mathematical function is a spanning line that spans a distance between the two points (col. 2, lines 66-67, col. 3, lines 1-36).

(7) With regard to claim 7, claim 7 inherits all the limitations of claim 6. O'Dea et al. further discloses in (Fig. 2 (210)) determining a value representing a straight-line distance between said points (col. 2, lines 66-67, col. 3, lines 1-36).

(8) With regard to claim 8, claim 8 inherits all the limitations of claim 7. O'Dea et al. further discloses in (Fig. 2 (210)) wherein the value representing the straight-line distance value is computed using a function (col. 2, lines 66-67, col. 3, lines 1-36).

(9) With regard to claim 9, claim 9 inherits all the limitations of claim 7. O'Dea et al. further discloses in (Fig. 2 (210)) wherein the value 1 is used to represent the straight-line distance value (col. 5, lines 50-57).

It is well known in the art that when a system is normalized all values equal 1. Therefore, it is inherent that the straight-line distance in a normalized system is 1.

(10) With regard to claim 10, claim 10 inherits all the limitations of claim 7. O'Dea et al. further discloses wherein the measure of the phase of the communications signal at the approximate time instant is represented by a trigonometric function of the phase (col. 3, lines 3-16).

(11) With regard to claim 11, claim 11 inherits all the limitations of claim 10. O'Dea et al. further discloses in (Fig. 2, (210)) wherein the trigonometric function is computed using said straight-line distance value (col. 2, lines 66-67, col. 3, lines 1-36).

(12) With regard to claim 12, claim 12 inherits all the limitations of claim 11. O'Dea et al. further discloses wherein the trigonometric function is approximated by: performing

multiple comparison operations; and based on results of the comparison operations, selecting one of multiple pre-stored values (col. 4, lines 45-65).

(13) With regard to claim 19, claim 19 inherits all the limitations of claim 6. O'Dea et al. further discloses in (Fig. 6) wherein the intersecting line is orthogonal to the spanning line. O'Dea et al. does not explicitly disclose an intersecting line orthogonal to the spanning line, however O'Dea et al. does disclose channel symbols that are placed 45 degrees apart from each other therefore if the spanning line is a straight line between two symbols that are across from each other then the intersecting line will be orthogonal to the spanning line.

(14) With regard to claim 20, claim 20 inherits all the limitations of claim 6. O'Dea et al. further discloses in (Fig. 6 (620)) wherein the communications signal is formed in accordance with a signal constellation in which at least two signal points are located at different distances from the origin in the complex plane, and wherein identifying a time instant in the vicinity of which the signal is likely to fall below the desired signal minimum comprises: dividing a straight-line distance along a transition line between two constellation points into two ratioed portions based on a point of intersection of the transition line with a normal passing through the origin (col. 5, lines 50-57, col. 6, lines 15-46).

4. Claim 18 is rejected under 35 U.S.C. 102(b) as being anticipated by O'Loughlin (US Patent 5,705,959).

O'Loughlin discloses a method of altering a communications signal to reduce a average-to-minimum power ratio thereof, comprising: performing conditioning of the

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communications signal in a first domain to form a modified communications signal; and performing conditioning of the modified communications signal in a second domain to form a further modified communications signal; wherein the first domain is one of a quadrature domain and a polar domain and the second domain is a different one of the quadrature domain and the polar domain (col. 5, lines 48-51, col. 6, lines 9-32, 44-54, 64-65).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 15 rejected under 35 U.S.C. 103(a) as being unpatentable over O'Dea et al. (US Patent 5,805,640) as applied to claim 1, in view of O'Loughlin (US Patent 5,705,959).

With regard to claim 15, claim 15 inherits all the limitations of claim 1. However, O' Dea et al. does not disclose the communications signal being represented in polar form having a magnitude component and a phase-related component.

However O'Loughlin discloses the communications signal being represented in polar form having a magnitude component and a phase-related component (col. 6, lines 9-32, 44-54).

Therefore it would have been obvious to one of ordinary skill in the art modify

O'Dea et al. to incorporate the communications signal being represented in polar form have a magnitude component and a phase-related component in order to provide for high efficiency and low distortion and to apply magnitude and phase modulation simultaneously.

Allowable Subject Matter

7. Claims 13, 14, 16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a method of altering a communications signal to reduce an average-to-minimum power ratio. Prior art references show similar methods but fail to teach: **“deriving from said points a line segment lying with a first quadrant of the signal plane, wherein the comparison operations compare a slope of the line segment with multiple predetermined slopes”**, as in claim 13; **“deriving from said points a line segment lying within a first quadrant of the signal plane, wherein the comparison operations comprise applying successive rotations to the line segment and after each rotation, applying a binary criterion to a location of the line segment in the complex plane”**, as in claim 14; **“wherein phase is the phase-related component, comprising, during a time interval in which the phase of the communications signal changes from a first value to a second value, interpolating between actual phase values and a line extending between the first value and the second value”**,

as in claim 16; and **“adding to the signal component two corrective pulses that together have a negligible effect on the signal component outside a limited period of time”**, as in claim 17.

Conclusion


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

CicelyWare

cqw
October 27, 2004


AMANDA T. LE
PRIMARY EXAMINER